# FEEPS Troubleshooting and MPS Fault Checklist

This guide, although not all-inclusive, is the primary troubleshooting resource for FEEPS issues involving ring-wide beam aborts (MPS trips). The issues represented here are historically the most common problems encountered when performing recovery from an MPS trip.

Is there power to FEEPS at the Mezzanine?

> PLC should be running and not faulted. The MPS chassis, VAT vacuum chassis, 24VDC supply and DIW chassis (if so equipped) should all have power. A loss of any of these will cause an MPS abort.

Is the UPS on batteries?

> V1.0 systems sectors 1 to 7-does not apply, central UPS. FEEPS does not monitor UPS behavior.
>
> All other systems:
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> V1.0 systems greater that sector 7-observe that the UPS is not on batteries, and from the back door, observe that the level translator module's LED is glowing.
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> If a UPS must be removed from service, the input from the module MUST be bypassed, or the system will not reset. Spare UPSs are available in the cage; the tested units have a green dot on the front panel. When replacing a UPS, the standard test is to run on batteries for 35 seconds, by shutting off the main Pulizzi power switch. On both interruption and resumption of power to the UPS, monitor the PLC for resets. The Green Processor (PROC) LED on the PLC should never go out. If it does, try another UPS.
>
> V2.0 and V2.1-Go to the UPS page on the Mezzanine HMI.

Has the Fast Valve tripped?

> All versions-go to the VAT chassis, the Fast Valve is the "Shutter" module. The upper green lamp indicates open. A red closed LED indicates a trip has likely occurred.
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> V1.0 and V2.0 systems-CC1 (Left High Voltage module) should indicate inrush not present (inrush LED off).
>
> V2.1 systems-both CC1 and CC2 (Right High Voltage module) need to agree before Fast Valve will trigger. If an inrush event has occurred, both inrush LEDs will be on

Is there a FE Vacuum fault?

V1.0-observe if IP1 is indicating good vacuum. Note that a transient event may trigger an MPS trip (for example, beam mis-steered into a non-dissipative component, such as the enclosure), but then the vacuum will recover as soon as beam is removed.

V2.0-V2.1-Vacuum trips are indicated by the HMI. Correct and reset.

NOTE: on the following beamlines:
2BM, 2ID, 4ID, 5ID, 6ID, 8ID, 9BM, 9ID, 12BM, 12ID, 13ID, 15ID, 18ID, 19ID, 20BM, 20ID, 33ID

There is NO Beryllium Window protecting the storage ring from user vacuum. Vacuum Group must approve all corrective actions to Front-End Vacuum. Contact Try Leng Kruy for instructions, co-ordinate with the Floor coordinators.

Is there a FE DIW Fault?

All systems-ANY DIW fault in front of, and including PS1 will cause an MPS trip. The condition that caused the fault MUST be corrected before any reset is attempted.

V1.0-Any DIW controller in fault will latch, and flash AL (Alarm) in the upper LF corner. If the water flow condition has been corrected, press and hold the 1$^{st}$ and 3$^{rd}$ buttons to clear alarm. NOTE: the System (FEEPS) must be reset after the Love Controller is reset. See below under additional details.

Spare Love controllers are available in the Lab, and are pre-configured by type. I.e.- If a PS1 Flow controller at a BM line has failed, the same controller in the lab chassis will be set up for this function, including set points.

V2.0-The DIW screen will indicate any signals in fault as either red or yellow. Any signal in red will interrupt the MPS permit.

V2.1-The Fault Screens will indicate any DIW faults in red. Any DIW fault up to and including PS1 will cause an MPS trip.

Additional details-

V1.0 systems

There are two resets available, the standard reset (depress the reset button on the Control Panel, or EPICS screen) and the Master Reset, which can be performed by simultaneously pressing the Reset button and the PS1 Close button. This can only be performed at the control panel. Attempt to use the standard reset first. If that fails, use the Master Reset. If that fails, the conditions that caused the fault likely still exist.

Avoid power-cycling the Love Controller Chassis at all costs, as we've been losing a lot of controllers this way as of late. Dave Travis recommends de-powering all of the controllers by unplugging them, re-powering the chassis, then re-starting the controllers individually.

V2.0 systems

Reset can be performed either via EPICS or the mezzanine HMI. The master reset can only be accessed by halting, and then restarting the Processor code, either by the key switch on the processor, or power cycling the rack.

V2.1 systems

EPICS control has been disabled due to communications problems at 23ID. All functions can only be controlled at the mezzanine HMI. There is no master reset function-the reset button will reset all faults if the conditions causing the faults have been cleared.

List of system vs. Software/hardware version:

V2.0-Sector 16 (both BM and ID), Sector 22 (both BM and ID)
V2.1-23ID, 31ID
V1.0-all other systems

Code replacement to a damaged processor:

Go to the following folder in Nickel:

\\Nickel\ISIG_Share\Database\Current Code Loads

There, you will find subdirectories of all current loads. Simply copy the .RSP file to a floppy, and load into the processor with a Chain A validation Laptop. You will likely find several versions, use the most recent. The others will use the extension _BAK in their filenames (for example, ID-NOBIV_BAK003.RSP), ignore them. Use the same download technique as in PSS validation. An appropriate DH+ cable is located in the spare parts cabinet, alongside the spare processors.

Code replacement to a damaged HMI:

In the Lab you will find a powered up terminal. It contains a memory card with the images of all the current HMI code loads. Under memory card, select the desired file (based on location) and press the Restore From Card button. When transfer is complete, the terminal will automatically restart, and may be used at the programmed location.

If you need field access to the setup screen:
From the main menu, press the System Manager button. The password is srmps2001. From there, press the Go to Gonfig Screen button. That will take you to the setup screen.

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